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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,086	04/23/2004	Mikio Ishihara	461-175	9229

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EXAMINER

KEMMERLE III, RUSSELL J

ART UNIT	PAPER NUMBER
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1731

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/830,086	Applicant(s) ISHIHARA, MIKIO	
	Examiner Russell J. Kemmerle	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/17/06, 10/19/06, 12/05/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claim 1-12 and 14-16 is withdrawn in view of the newly discovered reference(s) to Seiji (Japanese Patent Publication Number 10-057730). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 10-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seiji (Japanese Patent Publication Number 10-057730) (all citations to the Seiji reference indicate where that information can be found in the English translation of the document accompanying this office action).

Seiji discloses a ceramic honeycomb filter, and a method of its production. Specifically, Seiji discloses a method of forming a honeycomb filter by extruding a

ceramic material through a die in order to create a honeycomb shape (page 17, paragraph 33). As the ceramic material is extruded it is introduced into a tapered jig which causes the deflection of the walls of the cells which make up honeycomb structure (page 18 paragraph 35). This step does not create a sealed object, but instead leaves small holes in the altered cross section of the ceramic honeycomb. The tapered jig is located on a table, which moves at a speed synchronized with the extrusion speed of the ceramic honeycomb structure (page 18 paragraph 35). After the honeycomb has been extruded to the desired length, it is cut (pages 18-19 paragraph 36). The small holes formed in the cross section above during the tapering step are then sealed with a sealing agent, and the honeycomb filter is then dried and fired (page 19 paragraph 38).

Seiji does not disclose that the honeycomb filter is extruded into the tapered jig to form the desired shape, dried and fired, then fitted with plugs to seal the openings of the cells. However, it would have been obvious to one of ordinary skill in the art at the time of invention by applicant that if the honeycomb structure were fitted with plugs first then fired or fired first then fitted with plugs would produce essentially the same final product. Thus the idea of drying and firing the honeycomb structure taught by Seiji, then sealing the small holes as discussed above would have been obvious to one of ordinary skill in the art.

Referring to claim 2, Seiji discloses that the movement of the tapered jig is synchronized with the extrusion rate of the ceramic material (page 18 paragraph 35).

Referring to claim 3, the tapered jig would inherently have protrusions at positions opposed the portions used to create the small openings since it is the deflection along the protrusions which causes the small openings to be formed.

Referring to claim 4, Seiji discloses holes which run through the tapered jig from the side opposite where the honeycomb structure is contacted through to the space where the small openings are formed (page 20 paragraph 41, reference number 11 in Figs. 3-6).

Referring to claims 5 and 6, Seiji discloses that the material of the honeycomb filter is a ceramic, specifically such as alumina (pages 13- 14 paragraph 24).

Referring to claims 10 and 11, Seiji further discloses the ceramic being extruded include an organic binder, specifically methyl cellulose (pages 17-18 paragraph 34).

Referring to claim 12, it would have been obvious to one of ordinary skill in the art that the steps recited above could be repeated to create a plurality of honeycomb filters since no damage is done to the parts that would prevent them from being reused, and it would be wasteful to use them only once to create only one honeycomb structure.

Referring to claims 15 and 16, Seiji discloses that this honeycomb structure be used to remove particles in exhaust gas from an internal combustion engine, specifically a diesel engine (pages 5-6 paragraph 2). This would require that the filter be placed in the path of the exhaust gas in order to remove those particles.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seiji in view of Ishihara (US Patent 6,863,705). Seiji is relied upon as discussed above, but does not disclose that the ceramic material include a pore-providing material,

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specifically a carbon, a resin or a mix, more specifically where the resin is a thermoplastic resin selected from the group consisting of acrylic resin, poly(methyl stearate) resin and vinyl chloride resin.

Ishihara discloses a ceramic honeycomb filter made out of a ceramic material, where the ceramic further includes a pore-providing material, specifically a thermoplastic resin. Specific examples given by Ishihara of suitable thermoplastic resins include acrylate resin, stearic acid methyl, vinyl chloride resin and others (col 5 lines 40-41). It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have modified the honeycomb structure taught by Seiji by using a ceramic material further comprising a thermoplastic material of the kind taught by Ishihara since Ishihara discloses that such an addition is helpful in forming a ceramic honeycomb structure.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seiji in view of Itoh (US Patent 6,972,045). Seiji is relied upon as discussed above, but does not disclose that the honeycomb structure has cells with a cross section that is substantially a triangle.

Itoh discloses a ceramic honeycomb filter, including one where the cells have a substantially triangular cross section (Col 7 lines 8-52, Fig 8). It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have modified the honeycomb structure taught by Seiji by creating the cells with a substantially triangular cross section as taught by Itoh since Itoh teaches that such a cross section makes an effective ceramic honeycomb structure, and teaches how to

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create such a structure including a tapered jig for increasing the cross sectional area of some of the cells.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell J. Kemmerle whose telephone number is 571-272-6509. The examiner can normally be reached on Monday through Friday, 8:30-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
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